Mrs. Hayden

Name Key   Date______

201 Ch 5 Review

1. orthocenter ______ What center is formed by the 3 altitudes of a triangle?

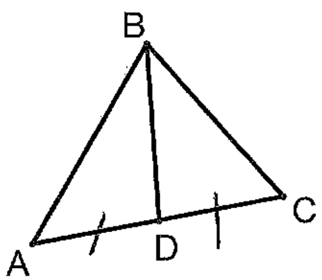
2. centroid ______ What center is formed by the 3 medians of a triangle?

3. circumcenter ______ What center is formed by the 3 perpendicular bisectors of the sides of a triangle?

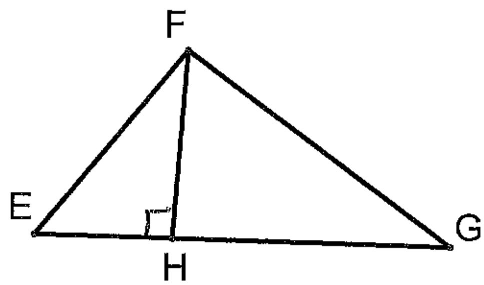
4. incenter ______ What center is formed by the 3 angle bisectors of a triangle?

Mark the following pictures with what you know to be true based on the given information. (either right angles or congruent segments or angles)

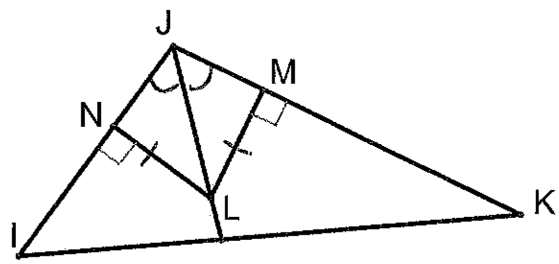
5. $\overline{BD}$ is a median of $\triangle ABC$.



6. $\overline{FH}$ is an altitude of $\triangle EFG$



7. $\overline{JL}$ bisects $\angle IJK$.



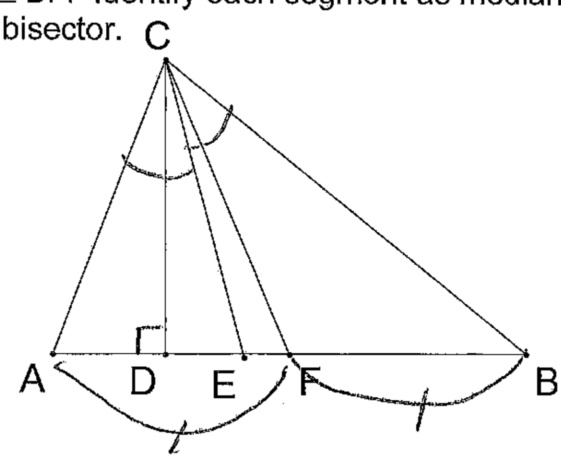
Use the following diagram for #s 8-10.

Given: $\overline{AB} \perp \overline{CD}$, $\angle ACE \cong \angle BCE$, and $\overline{AF} \cong \overline{BF}$. Identify each segment as median, altitude, angle bisector, or perpendicular bisector.

8. Angle Bisector ______ $\overline{CE}$

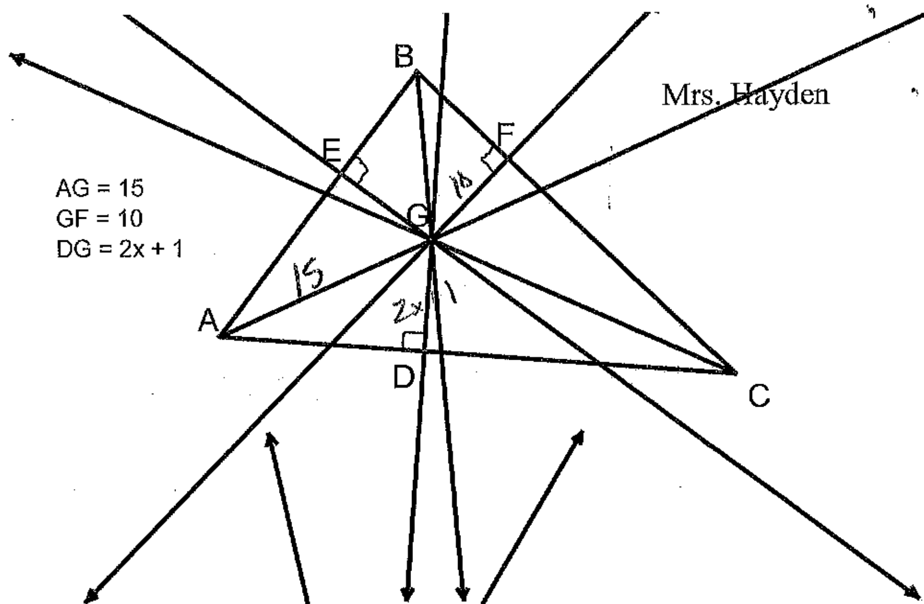
9. Median ______ $\overline{CF}$

10. Altitude ______ $\overline{CD}$



11. G is the incenter.

AG = 15
GF = 10
DG = 2x + 1



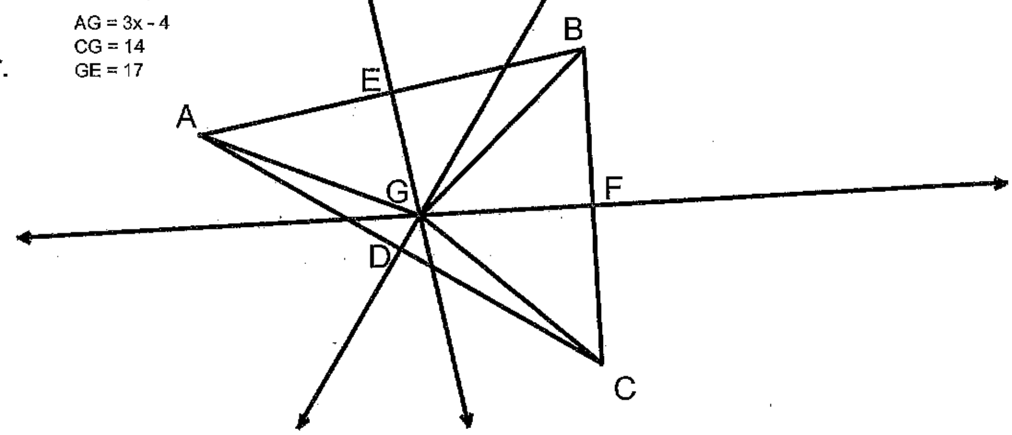
x = 4,5

2x+1 = 10

x = 4.5

12. G is the circumcenter.

AG = 3x - 4
CG = 14
GE = 17



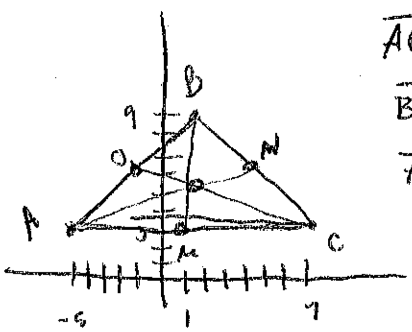
x = 6

3x − 4 = 14

3x 18

x = 6

13. Find the coordinates of the centroid of ΔABC. Given A(-5, 3) B (1, 9) C(7, 3).



$\overline{AC}$ m(1,3)

$\overline{BC}$ N(4,6)

$\overline{AB}$ O(-2,6)

use vertical b/c x = 1

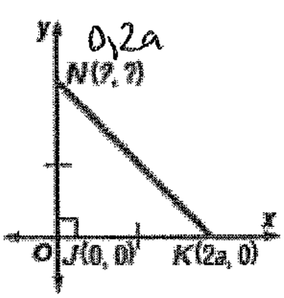
BM = 6

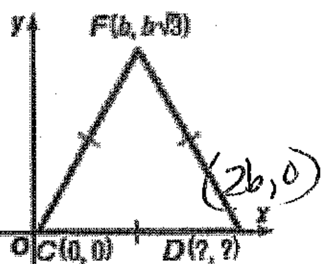
$\frac{2}{3} \cdot 6 = 4$

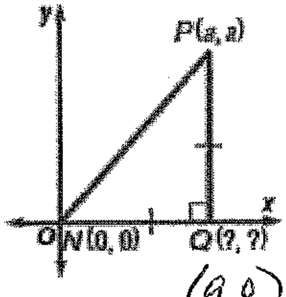
9 - 4 = 5

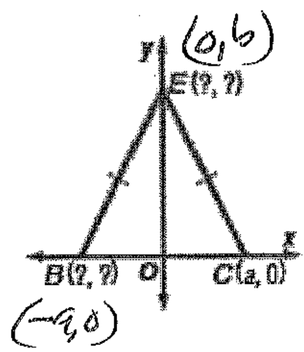
Centroid (1,5)

14. Find the missing coordinates of each triangle.









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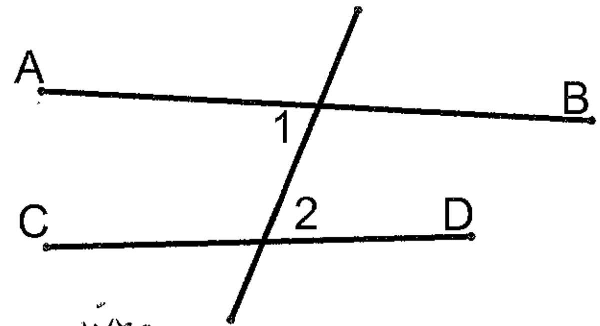
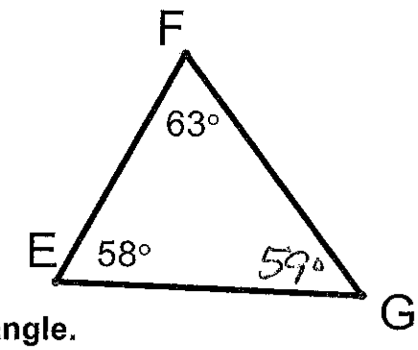
15. Complete the following indirect proof.



Given: $\angle 1$ and $\angle 2$ are not congruent
Prove: AB and $\overline{CD}$ are not parallel.

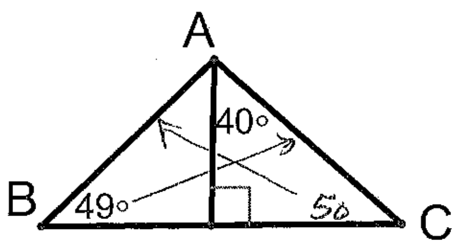
Assume $\overline{AB} \parallel \overline{CD}$ then $\angle 1 \cong \angle 2$ by alt int $\angle$s thm. * Contradicts given
Our assumption is false
$\therefore \overline{AB} \nparallel \overline{CD}$

Name the shortest segment.
16. $\overline{FG}$

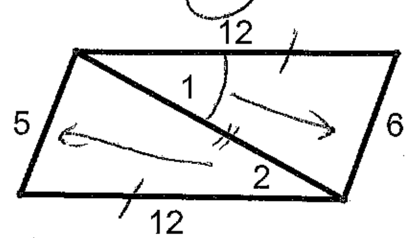


Circle the larger segment or angle.

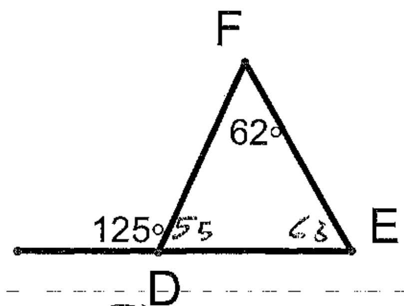
17. $\overline{AB}$ or $\overline{AC}$



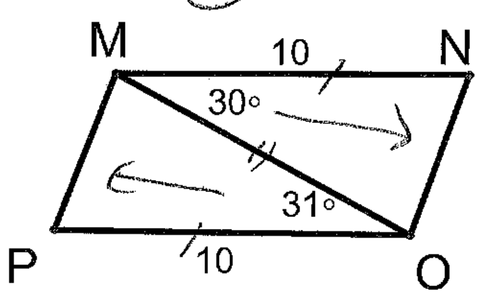
18. $\angle 1$ or $\angle 2$



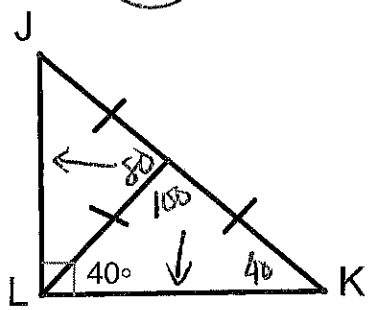
19. $\overline{DF}$ or $\overline{EF}$



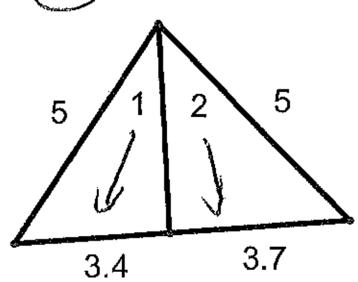
10. $\overline{MP}$ or $\overline{NO}$



11. $\overline{JL}$ or $\overline{LK}$



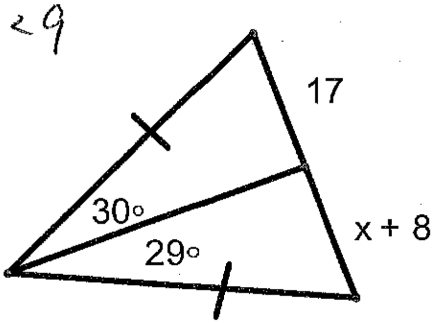
12. $\angle 1$ or $\angle 2$



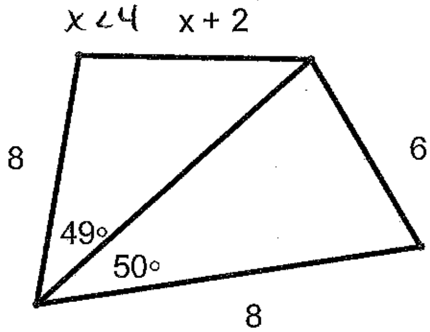
Write an inequality to describe the possible values of x.

13. $-8 < x < 9$ 14. $-2 < x < 4$ 15. $x > 36$

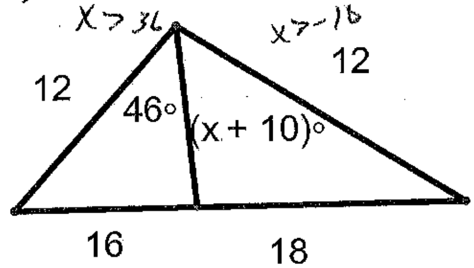
$x+8 < 17$
$x < 9$



$x+2<6$
$x<4$



$x+10 > 46$
$x > 36$
$x > -10$



Is it possible for a triangle to have sides with the lengths indicated?

16. y 13, 15, 20

17. y 6, 6, 11

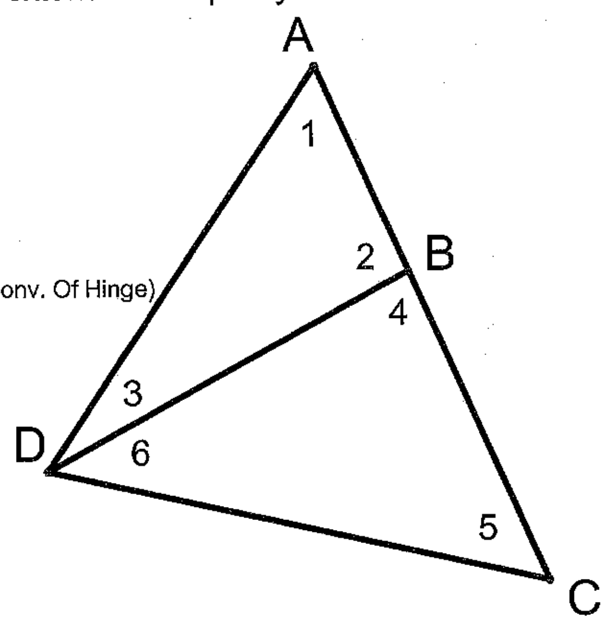
18. n 4, 9, 13

19. Two sides of a triangle are 7 and 9. What is the range for the 3rd side?

2 < x < 16

$$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array} \qquad \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

20. Complete the following statements so that they would be justified by an inequality theorem. (Hinge Theorem, Converse of Hinge Theorem, triangle inequality theorem, Theorems 5.10 and 5.11, or the exterior ∠ inequality theorem.)



a. If m∠4 > m∠5, then DC > DB. (thm. 5.11)

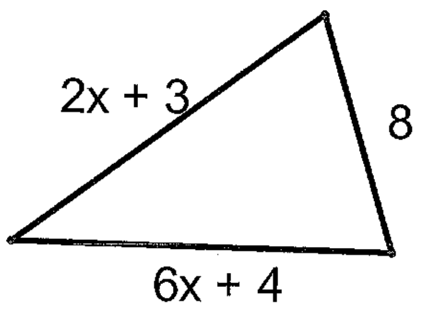
b. If m∠1 > m∠5, then CD > DA. (thm. 5.11)

c. If AD = DC and AB < BC, then m∠6 > m∠3. (Conv. Of Hinge)

d. AC + DC > AD. (Triangle ineq.)

e. m∠2 > m∠6 or m∠5. (Ext. angle ineq.)

21. Describe the possible values for x.



$8x + 7 > 8$
$8x > 1$
$x > 1/8$

$6x + 12 > 2x + 3$
$4x > -9$
$x > -\frac{9}{4}$

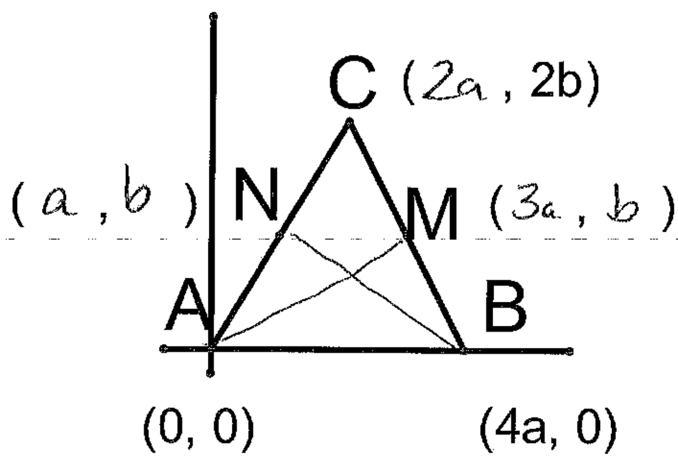
$2x + 11 > 6x + 4$
$7 > 4x$
$\frac{7}{4} > x$

$2x + 3 > 0$
$2x > -3$
$x > -\frac{3}{2}$

$6x + 4 > 0$
$6x > -4$
$x > -\frac{2}{3}$

$\frac{1}{8} < x < \frac{7}{4}$

22. Do the following coordinate proof.



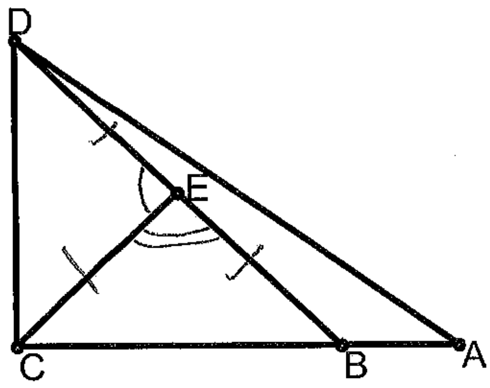
Given: Isosceles ΔABC, where M and N are midpoints of the legs.
Prove: AM = BN

$AM = \sqrt{(3a-0)^2 + (b-0)^2}$
$AM = \sqrt{9a^2 + b^2}$

$BN = \sqrt{(4a-a)^2 + (0-b)^2}$
$BN = \sqrt{9a^2 + b^2}$

$\therefore AM = BN$

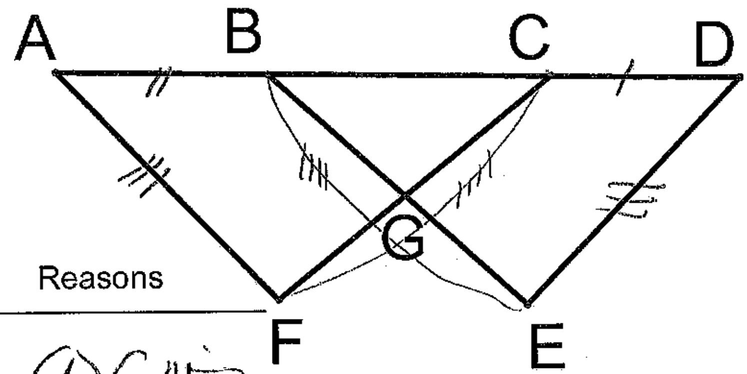
23.
Given: EC = EB = ED; m∠CEB > m∠CED
Prove: AC > CD



Statements	Reasons
(1) ~	(1) Given
(2) AC = AB + BC	(2) SAP
(3) AC > BC	(3) def of ineq
(4) BC > CD	(4) Hinge thm
(5) AC > CD	(5) transitive

24. Given: AB >DC; AF = DE; FC = EB;

Prove: m∠AFC > m∠DEB



Statements	Reasons
(1) ~	(1) Given
(2) BC = BC	(2) Ref
(3) AB + BC > BC + CD	(3) Add
~~(4) m∠AFC > m∠DEB~~	~~(4) Conv~~
(4) AB + BC = AC BC + CD = BD	(4) SAP
(5) AC > BD	(5) subst
(6) m∠AFC > m∠DEB	(6) Conv. of Hing thm